

## Appendix D- Design Features by Resource

The following design features are intended to minimize or mitigate effects to specific resources that may be caused by project activities. In some cases, specific forest plan standards or guidelines are listed to ensure certain resources are protected as intended by the forest plan. Please refer to the forest plan for details.

### Fire and Fuels

The purpose of the design features for the fire/fuels resource is to ensure that fire management activities related to the action alternatives have a high probability of success in meeting the silvicultural, air quality, and fuels objectives, as well as being implemented in a safe and efficient manner.

#### Design Features

1. Directional felling (into the interior of the units) would be used to minimize the amount of activity fuels along unit boundaries.
2. To reduce fuel loading, tops and limbs would be yarded in harvest units wherever possible.
3. Slash pullback, concurrent with harvest, would be done to minimize slash outside of the unit.
4. Slash piles should be constructed free of stumps, soil, snow, and non-woody organic material, and should be burned as dry as practical to enhance efficient combustion.
5. Prescribed burning may occur at any time of year, as prescription parameters, burn windows, and smoke emissions restrictions permit.
6. All burning activities would be conducted according to the requirements of the Montana/ Idaho Smoke Management Unit guidelines outlined in the Montana/Idaho Airshed Group Operating Guide (2010).
7. Where prescribed fire is used as a treatment method, firelines and /or fuelbreaks would be constructed as needed, and as determined by fire managers. Topographic and vegetative features of the landscape may also be used for containment of prescribed fires when possible.
8. Schedule of logging will be such that coordination between harvest, burning, and road closure will be timely and efficient. In order to accomplish proposed prescribed burn activities and achieve site preparation requirements most-effectively, logging operations should be completed in such a way that allows units to be released for slash treatment as soon as possible after harvest, and before roads are stored or decommissioned.

**Table D 1: Risk Factors and Risk Level With and Without Design Features**

<b>Factor</b>	<b>Risk Level without Design Features</b>	<b>Risk Level with Design Features</b>
Landing or Grapple pile burn escapes	Low. Pile burning generally occurs late in the season after recent moisture has precipitated on the outside of piles and surrounding fuels.	Low. With directional felling minimizing material along unit boundaries, and with piles being lit under appropriate weather conditions, risk of escape is low. (DFs #1, #3)
Smoke from landing pile burning creates hazard along open routes	Moderate. Pile burning generally occurs late in the season and may overlap with hunting season.	Low. When piles are constructed cleanly and burned as dry as possible, combustion is fairly efficient, minimizing smoke generation. Piles are burned according to requirements of MT/ID SMU when weather conditions for dispersal are acceptable. (DFs #4, #5, #6)
Wildfire spreads from outside of unit to within unit, or vice versa	High. Without treating activity slash, expected rates of spread post-harvest would be moderate to high, moving quickly through activity slash.	Low. Slash treatments include yarding limbs and tops to landings and burning/removing landings, spot grapple piling, directionally felling along boundaries, as well as prescribed burning. These treatments would isolate and disrupt fuel continuity generated through harvest, and provide effective breaks to fire spread. (DFs #1, 2, 3, 7)
Prescribed fire spreads from within unit to outside unit	High. Fire spread would be difficult to contain without firelines and/or fuelbreaks where fuels are continuous.	Low-Moderate. Containment lines would serve to disrupt fuel continuity and keep prescribed fire within desired areas. (DFs #5, #7)
Slash from harvest not treated in a timely fashion	High Slash hazard generated from harvest activities would not be reduced and could present a higher risk for fire spread as well as increase resistance to control.  Additionally, implementation costs could also increase.	Low-Moderate. A coordinated schedule of logging would encourage organized harvest operations so units could be released and slash hazard and site preparation activities completed in a timely fashion so that slash hazard can be addressed. (DF #8)

## Watershed and Aquatic Resources

Based on the “high” ranking for road density (miles of road/mi<sup>2</sup>), stream crossing density (# crossings/mi<sup>2</sup>) and intersect frequency (# crossings/mile of stream) within the Homestead Project Area, the following design features are intended to mitigate road surface runoff sediment transport to streams:

## **Design Features**

1. For all in sloped roads with ditch, install rock check dams, constructed of 3" or greater angular rock within ditch, 50' above all perennial stream drain points and, rock ditch with 3" or greater angular rock from dam to drainage feature.
2. For all road/stream crossings, rock the road prism a minimum of 50' on the uphill and downhill approaches using 3" or lesser angular rock.
3. For all roads within 100' of a perennial stream, rock the road prism using 3" or lesser angular rock.

## **Best Management Practices (BMP) (Design)**

1. Include all applicable best management practices (BMPs) described in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22)
2. Cut and fill slopes should be designed to match the natural hillslope topography to avoid instability.
3. On outsloped road cuts, with an active ground water expression, the implementation of a cross drain, French drain, and/or swale should be incorporated into the road design to prevent water pooling.
4. For temporary roads, all culverts should, at a minimum, accommodate a 25 year runoff event.
5. For permanent roads, all culverts should, at a minimum, accommodate a 100 year runoff event.
6. All culvert inlets and outlets should be armored with 3" or greater angular rock to prevent head cutting and/or piping.

## **Best Management Practices (Maintenance)**

1. Drainageways should be cleared of all debris generated during construction and maintenance to prevent flow obstruction and water quality impacts.
2. Unstable and erodible areas should be stabilized using seeding, compacting, rip-rapping, benching, weed free mulch, or other suitable method.
3. Established vehicle service and refueling areas and chemical storage sites should be located a minimum of 300ft. from wet areas and/or streams, using berms and dikes to contain any spills.
4. Incorporation of snow, ice, frozen soil, or organic material into road embankments should be avoided.
5. Runoff from concrete batching or aggregate operations should not be allowed to enter stream channels prior to treatment by filtration, flocculation, settling, or other acceptable methods.
6. Road maintenance activities should be postponed during periods of saturated road surfaces, heavy rainfall, or snowmelt.
7. Road palliatives, take all necessary precautions to prevent the intrusion of these fugitive dust reducing chemicals into drainage features leading to streams.
8. The side-casting of materials into ditches, wetlands, or streams during road maintenance should be avoided.
9. During snow plowing operations, care should be taken to prevent damage to road surface, undercut slopes, or side-casting material into ditches, wetlands, or streams.

10. During snow plowing operations, breaks in snow berms should be provided to allow for adequate drainage and erosion prevention.

## **Sensitive Plants and Invasive Weeds**

### **Sensitive Plant Species:**

If threatened, endangered, and/ or sensitive plant species are discovered during project implementation, an agency botanist will be notified so that appropriate site-specific measures would be taken to maintain population viability. Measures to protect population viability and habitat for occurrences could include, but are not limited to:

1. Modifying activity methods to protect rare plants and their habitats or otherwise modifying the proposed activity,
2. Implementing buffers around plant occurrences.

Areas requiring revegetation (such as along road margins) would use native plant materials as required in FSM 2070.3 (Amendment 2008). Locally-obtained materials are preferred, but if unavailable or economically unfeasible, appropriate materials may be substituted that meet Region 1 guidelines.

### **Invasive Weeds:**

1. The following measures would be taken to reduce the risk of invasive weed introduction and spread in accordance with the St. Joe Noxious Weed Control Environmental Impact Statement (Record of Decision, October 12, 1999).
2. Treatment would be implemented in accordance with priorities set by the noxious weed program if new populations of noxious weeds are found. New invader species would be slated for eradication immediately upon discovery. Other weed infestations would be treated according to direction in the St. Joe Noxious Weed Project Final Environmental Impact Statement and Record of Decision, and St. Joe Ranger District priorities.
3. Glyphosate would not be used to treat weeds in the project area.
4. Roads used for timber hauling would be treated with herbicides by the timber sale purchaser before timber haul begins and after timber haul is complete.
5. All equipment taken off roads (includes machinery used in restoration projects, and logging and construction equipment) would be cleaned prior to entering the project area to remove dirt, plant parts, and material that may carry weed seeds. A provision would be included in contracts.
6. Mulching would be done where deemed appropriate by the project administrator and botanist. On-site slash could be used. Contract provisions would be included in contracts.
7. After implementation, project areas would be monitored for new populations of noxious weeds. If new populations are found more intensive surveys would be conducted, sites would be mapped, and treatment would be scheduled.
8. Weed treatments would be monitored for effectiveness.
9. Provisions in the timber sale contract require the purchaser to seed and fertilize areas of soil disturbance such as those associated with skid trails, road construction, road cuts, and landings

using a seed mix approved by an agency botanist at the time of contract preparation. Prior to any and all changes to the seed mixes and time of the seeding a district botanist would be notified to approve changes.

10. Weeds would be treated on existing roads to be stored or decommissioned if they are not brushed in prior to road storage or decommissioning.
11. All plant materials used in the project, including grass seed and mulch, would be certified noxious-weed free. Grass seed would be certified, blue-tagged seed.
12. Native plant materials are required to be used in restoration projects (FSM 2070.3, Amendment 2008). Locally-obtained materials are preferred, but if unavailable or economically unfeasible, appropriate materials may be substituted that meet Region 1 guidelines (Northern Region Native Plant Handbook, 1995).

## Wildlife

### Threatened, Endangered, Proposed, and Sensitive Wildlife Species Management

Contract provisions for the protection of Threatened, Endangered, Proposed, and Sensitive (TEPS) species and settlement for environmental cancellation would be included. If TEPS species and/or significant habitat are discovered before or during project implementation the Sale Administrator and the district wildlife biologist would be notified so that if needed, measures could be taken to avoid impacts and meet Forest Plan Standards and Guidelines. Measures could include altering or dropping proposed units, modifying the proposed activity, or implementing buffers. The district biologist should be notified if any TEPS species are observed during project activity.

#### Gray Wolf

Any active gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. No project activities (excluding maintenance and hauling on year-round open road systems) will be allowed within one (1) mile of occupied sites, from April 1 through June 30 for den sites, and from July 1 through August 15 for rendezvous sites. Upon review by the Wildlife Biologist, these distances could potentially decrease based on topographical characteristics at each site.

#### Western Toad

All fish-bearing streams would be buffered by 300 feet on each side. Perennial streams and wetlands larger than one acre in size are buffered from ground disturbing activity by at least 150 feet. Smaller springs, seeps, and wetlands would be buffered by at least 100 feet if any are identified near or within harvest units.

#### Goshawk/Raptors

**Nests:** A no-activity area of 40 acres would be placed around any newly discovered goshawk nest or any nest that has been active in the past five years. If the nest tree is not roughly centered within the 40-acre

no activity area, an additional no activity distance of at least 745 feet (the radius of a 40-acre circle) may be implemented between the nest tree and harvest units to reduce impacts to habitat around the nest site from project activities. The District Wildlife Biologist would determine if this additional no activity distance would be implemented based on factors such as topography, the location of the nest tree within the 40-acre nest area, and the distance of the nest tree from private ownership and/or existing roads.

**Post-Fledging Areas:** Project activities would be suspended within the post-fledging areas from April 15 to August 15 to promote nesting success and provide forage opportunities for adults and fledgling goshawks during the fledgling dependency period. The units and road activities potentially affected by this design feature are subject to change year to year based on the location of the active nest during the year the activities are to occur. Activity restrictions may be removed after June 30 if the District Wildlife Biologist determines that a particular nest site is inactive or unsuccessful.

Maintenance of landscape-level connectivity and minimization of fragmentation was incorporated into the design of all alternatives with timber harvest. Travel cover was identified and considered in terms of connectivity. Site-specific design features for units with proposed vegetation removal in designated travel corridors are found in Table E-2.

#### Big Game

The proposed road storage may require obliteration for a distance of 300 feet, a sight-distance, or whatever distance is effective to eliminate motorized access. The amount and type of obliteration required would be the minimum needed to effectively prevent motorized vehicle use. This would vary depending on the slope and vegetation present. A guardrail barricade may be used if it can be placed to effectively prevent motorized access.

Existing gates would remain in place. Temporary gates would be installed on any road to be used that is not behind a gate and is currently not drivable. During timber hauling, the gate would be closed and locked at the end of each day. For other operations, gates would be closed and locked after the passage of each vehicle.

#### Cavity Nesting Species

Recommendations for snag numbers and snag recruitment levels would be based on Forest Plan (2015) guideline FW-GDL-VEG-04 and listed in the table below.

**Table D 2: Recommended Snag and Snag Recruitment Levels to Retain (where they exist) after Vegetation Management Activities (including Post Harvest Activities), by Harvest Type (USFS 2015)**

Dominance Group	Biophysical Setting	Snags > 15"+ DBH	Live Trees > 15.0" DBH
Ranges per Acre where Treatments Result in a Seed/Sap Size Class (Regeneration Harvest)			
All except lodgepole pine	Warm/Dry	2.0 – 4.0	0.5 – 3.0
	Warm/ Moist	4.5 – 6.5	1.0 – 5.5

<b>Dominance Group</b>	<b>Biophysical Setting</b>	<b>Snags &gt; 15"+ DBH</b>	<b>Live Trees &gt; 15.0" DBH</b>
	<b>Subalpine</b>	3.0 – 5.0	1.0 – 3.5
<b>Lodgepole pine</b>	<b>All</b>	1.0 – 2.5	0.5 – 3.0
<b>Ranges per Acre where Treatments Result in a Small or Medium Size Class (e.g., Commercial Thin)</b>			
<b>All except lodgepole pine</b>	<b>Warm/Dry</b>	2.0 – 5.0	20.5 – 32.5
	<b>Warm/Moist</b>	4.0 – 6.5	26.0 – 34.0
	<b>Subalpine</b>	3.0 – 5.0	20.0 – 25.5
<b>Lodgepole pine</b>	<b>All</b>	1.0 – 3.5	11.0 – 19.0
<b>Ranges per Acre for Treatments in the Large Size Class (e.g., Restoration)</b>			
<b>All except lodgepole pine</b>	<b>Warm/Dry</b>	2.5 – 6.0	19.0 – 32.5
	<b>Warm/Moist</b>	6.0 – 12.5	32.5 – 47.0
	<b>Subalpine</b>	4.5 – 11.5	23.0 – 45.0

#### Snag Guidelines under **FW-GDL-VEG-05 & 06**

- Group snags where possible;
- Retain snags far enough away from roads or other areas open to public access to reduce the potential for removal (generally more than 150 feet);
- Emphasize retention of the largest snags and live trees as well as those species that tend to be the most persistent, such as ponderosa pine, larch, and cedar;
- Favor snags or live trees with existing cavities or evidence of use by woodpeckers or other wildlife.
- During vegetation management activities (e.g., timber harvest), and in the event that retained snags (or live trees being retained for future snags) fall over or are felled (for safety concerns), they should be left on site to provide coarse woody debris.

#### Small Mammal Habitat

In harvest units where slash piles are created, one pile per 5 acres would be left unburned to supply potential forest carnivore rest sites, provide cover for small animals (prey habitat), and serve as potential den sites (IDFG 1995). Piles left should be those closest to standing timber, such as the unit edge or a large cluster of leave trees.

## Heritage

1. Directional fall trees away from site in areas where eligible sites are located.
2. If during project activities cultural material or human remains are encountered, all work will cease immediately, and the zone or forest archeologist will be contacted and the approved Region 1 “Unanticipated Discovery Plan and Discovery of Human Remains Protocols” (Plan) will be implemented. A mitigation plan, if needed, will be developed in consultation with the SHPO and federally recognized tribes of interests if appropriate.
3. All cultural resources (including the unanticipated discovery of any historic or prehistoric era sites) Including buildings, trails, mining or logging camps and chutes, and all other heritage properties that would be protected by avoiding, buffering, or mitigating impacts to those resources. The implementation plan will include a buffer of no less than 50 feet around known historic properties determined to be eligible for the NRHP.
4. All slash piling, either by hand or ground-based machines, will occur outside of eligible cultural resource boundaries. If burning of slash is necessary, however, within site boundaries, the project lead must check with an Idaho Panhandle National Forests archaeologist prior to implementation for concurrence regarding historic sites, rare isolates, features, or a combination of these things. All eligible and potentially eligible (unevaluated) historic properties with structural remains or other combustible feature types will be avoided or protected during all burning activities.
5. All landings and other staging areas, skid trails, and areas utilized for project operations will not be located within 100 feet of known eligible cultural resources. Landings placed outside of harvest units will be assessed by an Idaho Panhandle National Forests archaeologist prior to implementation.
6. Any changes to the proposed action that may occur during layout or implementation would be reviewed by an Idaho Panhandle National Forests archaeologist, and if necessary a cultural resource survey would be conducted prior to project implementation. Newly documented heritage properties would be evaluated, with specific protection measures put into place to protect the eligibility status of that property. Such measure could include dropping units from harvest activity; modifying unit boundaries to provide adequate buffers around documented eligible properties, as determined by a qualified archaeologist; and/or modifying harvest methods.
7. On Marble Creek Certain entry/exit points will be established for machinery to avoid eligible/unevaluated cultural sites. Due to the density of sites in this area, a map will be provided prior to implementation denoting areas of avoidance, and entry and exit points within the Marble Creek restoration corridor.

## Scenic

Treatment unit boundaries would resemble the shape of natural openings in the surrounding area, would not be symmetrical in shape, avoid right angles and straight lines, and follow natural topographic breaks and changes in vegetation.

Locate temporary roads U13Temp, U14Temp, U20Temp, U21Temp, U21Temp2, U25Temp, U26Temp, and U28Temp so as to take advantage of topographic and vegetation screening as feasible. These temporary roads will be fully recontoured and reseeded once operations are completed.

Dispose of slash piles as soon as possible after they are generated. Where slash piles are visible in the foreground of Forest Road 321, ensure 95 percent consumption of the piles, even when this



may mean re-piling and re-burning. Scattering slash that has not be consumed by burning is also acceptable.

Minimize cuts and fills associated with road and landing construction, and recontour and reseed temporary roads, landings, and slash piles when harvest activities are completed.

Units 30, 31B, 32A, 32B, 33, 34, and 35: Break up the created openings resulting from treatment in these units using groups of leave trees to provide vertical structure within the harvest area and break up the opening. These would be both live and dead trees emulating the same structure that would remain after a natural mixed-severity wildfire. These leave trees would have an irregular or uneven distribution and can range from individual trees to groups of trees up to 3 acres in size and may also include leave areas adjacent to unit boundaries.

Units 30, 31B, 32B, 34, and 35: Retain adequate trees to minimize the visibility of the existing roads within these units as seen from Forest Road 321 south of the project area.

Units 1A, 1B, 2A, 2B, 5A.4, 12, 13, 14, 20, 21, 22, 25A, 25B, 26, and 28: Retain trees along FR 321 to break up views into these units. This can be accomplished through concentrating some of the reserves near the road frontage. It may also require additional trees or groups of trees to provide a natural-appearing partial screen as seen from the road.

Feather all unit boundaries visible from FR 321 in immediate foreground, foreground, middleground viewing distances.

To minimize the visual impact of painted tree boles following completion of the project as seen from FR 321, use cut- tree marking or other method in units 1A, 2A, 12, 13, 14, 20, 21, 25A, 25B, 26, and 28. In these units, use marking dots for boundary trees instead of lines.

## Soils

1. For any units harvested in the winter, equipment will operate on 12 inches of settled snow, or frozen ground. Units 1A.1, 5A.1, 5A.2, 5A.3, 20, 21, 22, 23, 25A and 34 are required to be harvested in the winter in order to prevent cumulative DSD that exceeds the soil quality threshold.
2. Suspend operations under wet or thawing conditions.
3. Heavily impacted skid trails and landings will be required to be decompacted or scarified following ground based harvest and fuel reduction activities, in order to reduce compaction and potential for erosion. For those heavily impacted existing skid trails that are not used during the course of the timber project, other funding mechanisms will be used to decompact and promote soil rehabilitation. Units for which supplementary rehabilitation efforts may be needed to maintain site productivity and function are 1A, 20, 21, 22, 23, 25A, 26, 28, 2A, 34, 5A.1, 5A.2, and 5A.3.
4. Machinery should avoid excessive pivoting in order to prevent soil displacement.
5. Coarse woody debris would be retained on the ground for sustained nutrient recycling in harvest units, consistent with FW-GDL-VEG-03 and FW-GDL-SOIL02.

6. Ground-based equipment (including grapple piling equipment) should only operate on slopes less than 40 percent, in order to avoid detrimental soil disturbance. Where slopes within an activity area contain short pitches greater than 40 percent, but less than 150 feet in length, ground-based equipment may be allowed, as designated by the Timber Sale Administrator.
7. Existing skid trails would be used where possible. All new skid trails would be designated and laid out to take advantage of topography and minimize disruption of natural drainage patterns. Where terrain is conducive, trails would be spaced at least 100 feet or more apart. There is a subset of units in which it is required to reuse a minimum amount of the existing skid trails in order to meet the regional soil quality standards. While unit specific details can be found in the project file, the units that would approach DSD threshold values if the skid trail reuse recommendations are not adhered to are as follows; 20, 21, 22, 26, 28, and 34. The soil scientist or timber sale administrator will need to work with the purchaser in order to ensure regional soil quality standards are being met.
8. Where material is available, ground disturbance associated with skid trails would be covered with randomly placed logs (on the contour), slash, or seeded with Forest approved seed mix to help increase the microtopography needed to reduce runoff and erosion.
9. When grapple piling, equipment will restrict operations to the existing skid trails wherever possible, particularly in units expected to be on the threshold for detrimental soil disturbance. In instances where grapple piling outside of the existing skid trails is necessary to meet fuels objectives, equipment would utilize the reach of the boom to the extent possible, avoid unnecessary pivoting, and restrict operations to 2 passes over any given area.
10. Equipment shall not be operated when ground conditions are such that excessive damage will result.
11. The leading end of logs would be suspended during skyline yarding.
12. No yarding across designated riparian habitat conservation areas (RHCA) would occur with this project.
13. All temporary roads and excavated skid trails would be rehabilitated (all new construction would be recontoured; existing prisms would be placed in a stable condition through recontouring and/or decompaction).
14. Prescribed burning (ex. pile burning, broadcast and underburning) would occur only when the upper surface inch of mineral soil has a moisture content of 25% by weight, or when duff moisture exceeds 60%, or when other monitoring or modeling indicates that soil productivity will be protected.
15. Burn piles would be small and numerous rather than large and few.

## Recreation

The following design features have been incorporated into the proposed action to minimize effects to motorized recreation and dispersed recreation opportunities.

1. Existing dispersed camp sites impacted by harvest activities or road modifications should be restored or reconfigured to provide a similar space for dispersed camping. See project record for Homestead Dispersed Recreation Opportunities map.
2. Plowing of groomed routes should only occur before December 15 or after March 15 to allow for grooming of motorized snow routes. Should plowing be necessary between December 15 and March 15 an area should be plowed to provide for parking at the end of the plowed route. See project record for Homestead Groomed Snow Routes map.